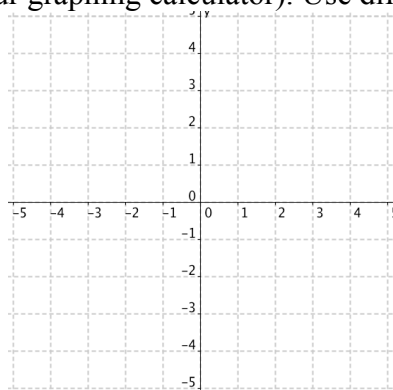


IW #8

1. The function $f(x) = x^n$ is called a *power function*.

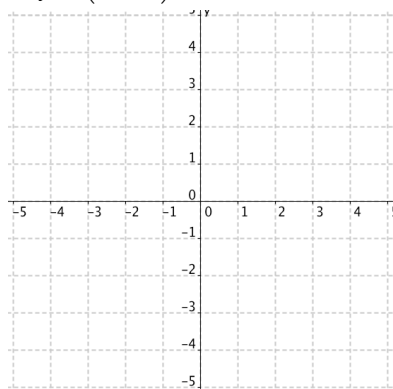
a. On the same axes below, sketch the power functions for $n = 2, 3, 4, 5$ (feel free to use Geogebra and/or your graphing calculator). Use different colors for each.



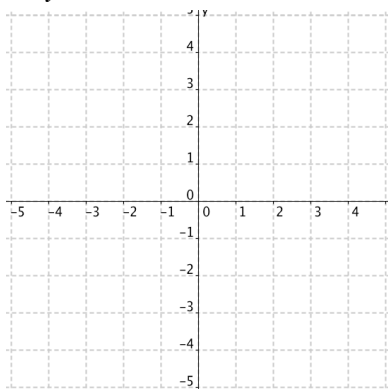
b. What two coordinates do all power functions share?

c. Use your knowledge of transformations along with your understanding of power functions to sketch graphs of the following without the aid of technology.

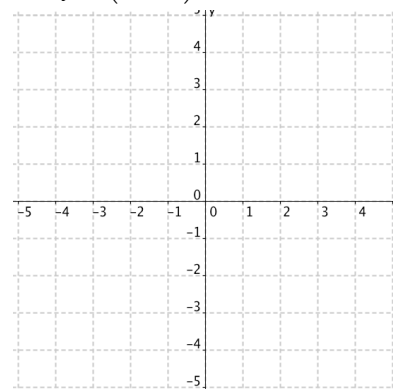
i. $y = (x + 2)^3 + 1$



ii. $y = -x^6 + 2$



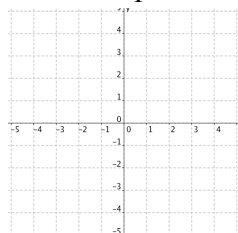
iii. $y = (x - 2)^7$



2. The function $g(x) = \sqrt{x}$ can be thought of two ways.

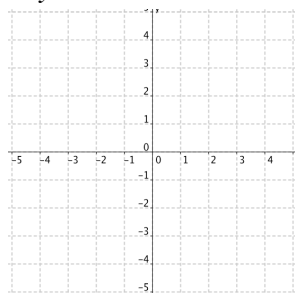
a. Graph the power function $f(x) = x^n$ for $n = \frac{1}{2}$ along with the other power function on the same axes above. See the connection?

b. Sketch the parabola $x = y^2$ on the axes below. Compare it to the graph from part a. See the connection?

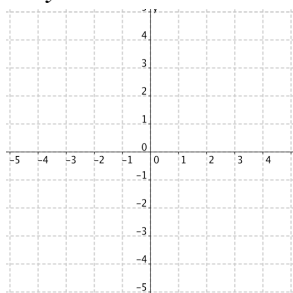


c. Use your knowledge of transformations and the graph of the parent function $f(x) = \sqrt{x}$ to sketch graphs of the following without the aid of technology.

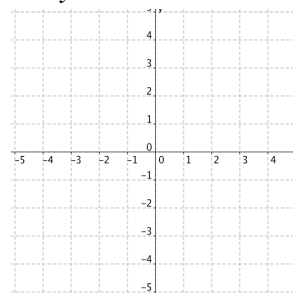
i. $y = -\sqrt{x+2}$



ii. $y = \sqrt{-x} + 1$



iii. $y = -3 + \sqrt{2-x}$



3. The *greatest integer function* is sometimes written as $f(x) = \llbracket x \rrbracket$. You can find it on your calculator by going MATH-NUM-int(. For example, to evaluate $\llbracket 2.3 \rrbracket$, you enter int(2.3) on your calculator.

a. Use your calculator to find the following:

i. $\llbracket 2.3 \rrbracket$

ii. $\llbracket -2.3 \rrbracket$

iii. $\llbracket 7 \rrbracket$

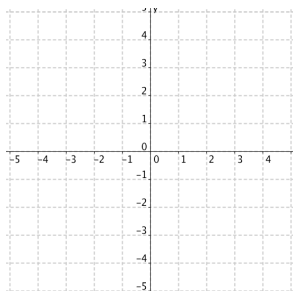
iv. $\llbracket 0 \rrbracket$

v. $\llbracket 6\frac{1}{3} \rrbracket$

vi. $\llbracket -\pi \rrbracket$

b. Based on your answers from part a, explain the *greatest integer function* in words.

c. Use your calculator to graph $y = \llbracket x \rrbracket$. Why do you think it's sometimes called the *staircase function*?



d. The *greatest integer function* in Geogebra is called floor(x). Why do you think it's called this?

e. Compare the graph of $y = \text{floor}(x)$, $y = 2\text{floor}(x)$, and $y = \text{floor}(2x)$ in Geogebra. Use different colors. How do these graphs connect to your understanding of transformations?

